

### REMARKS

Favorable reconsideration of this application in view of the remarks to follow is respectfully requested. Since the present Response raises no new issues, and in any event, places the application in better condition for consideration on appeal, entry thereof is respectfully requested under the provisions of 37 C.F.R. §1.116.

Before addressing the specific grounds of rejection, applicants have provided a new abstract, added new Claims 65, 66, 67, 68, 69, 70, and 71, and amended Claim 30.

The new abstract, which is attached with this response, attends to the minor typographical error that appears in the second line of the original abstract.

Newly added Claim 65 positively and clearly recites that the two spaced apart metal semiconductor compound regions further include an additional layer of conductive material 78 between the metal 16 used in the metal semiconductor compound regions and the first dielectric layer 18, the additional layer of conductive material 78 having sidewalls having insulating material 79 disposed thereon. Support for new Claim 65 may be found in FIG. 23. FIG. 23 is described in the amended specification included on Page 7, paragraphs 2 and 3, of the preliminary amendment submitted on April 17, 2000. The subject matter of Claim 65 was originally claimed in cancelled Claim 37, previously presented in the preliminary amendment dated April 17, 2000.

Newly added Claim 66 positively and clearly recites that the additional layer of conductive material 78 includes an oxidizable material. Support for new Claim 66 may be found in the amended specification submitted on Page 7, paragraph 3, of the preliminary amendment dated April 17, 2000. The subject matter of Claim 66 was originally claimed in cancelled Claim 38, previously presented in the preliminary amendment dated April 17, 2000.

Newly added Claim 67 positively and clearly recites that the additional layer of conductive material may comprise Al, Co, Er, Ni, Pd, Pt, Rh, Ta or Ti. Support for new Claim 67 is found in the amended specification submitted on Page 9, paragraph 2, of the preliminary amendment dated April 17, 2000. The subject matter of Claim 67 was originally claimed in cancelled Claim 39, previously presented in the preliminary amendment dated April 17, 2000.

Newly added Claim 68 positively and clearly recites that the metal of the metal semiconductor compound regions may comprise Al, Co, Er, Ni, Pd, Pt, Rh, Ta or Ti. Support for new Claim 68 is found in the amended specification submitted on Page 9, paragraph 2, of the preliminary amendment dated April 17, 2000. The subject matter of Claim 68 was originally claimed in cancelled Claim 40, previously presented in the preliminary amendment dated April 17, 2000.

Newly added Claim 69 positively and clearly recites that the field effect transistor may comprise two spaced apart metal semiconductor compound regions 16 including Ta and an additional layer of conductive material 78 including Al. Support for new Claim 69 is found in the amended specification submitted on Page 8, paragraph 3, of the preliminary amendment dated April 17, 2000. The subject matter of Claim 69 was originally claimed in cancelled Claim 41, previously presented in the preliminary amendment dated April 17, 2000.

Newly added Claim 70 positively and clearly recites that the insulating material 84 positioned on the sidewalls of the additional layer of conductive material 78 also covers the sidewalls of said first dielectric layer 18. Support for new Claim 69 is found in FIG. 24, which is described in the amended specification submitted on Page 8, paragraph 2, of the preliminary amendment dated April 17, 2000. The subject matter of Claim 70 was originally claimed in cancelled Claim 42, previously presented in the preliminary amendment dated April 17, 2000.

Newly added Claim 71 positively and clearly recites that the insulating material disposed on said sidewalls of the additional layer of conductive material 78 includes an oxide. Support for new Claim 71 is found on Page 8, paragraph 2, of the preliminary amendment dated April 17, 2000. The subject matter of Claim 71 was originally claimed in cancelled Claim 43, previously presented in the preliminary amendment dated April 17, 2000.

Further search is not required for consideration of new Claims 65-71, since the subject matter of the newly added claims was included in previously cancelled Claims 37-43. Therefore, previous searches directed towards cancelled Claims 37-43 are applicable to newly added Claims 65-71.

Claim 30 stands objected to for allegedly containing informalities. It is the Examiner's position that the term "local" should be "locally". In response to the Examiner's comments and for the purposes of advancing prosecution, applicants have amended Claim 30 to recite "locally". Therefore, in light of the amendment to Claim 30, applicants respectfully request that the objection be withdrawn. Applicants have also amended Claim 30 to replace the term "gate dielectric" with "gate dielectric layer".

Claims 30 and 33 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over U.S. Patent No. 5,159,416 to Kudoh ("Kudoh") in view of U.S. Patent No. 4,521,446 to Coleman, et al. ("Coleman, et al").

Applicants respectfully submit that the claims of the present application are not obvious from the disclosures of the combined applied references, since the applied references do not teach or suggest applicants' claimed device, as recited in amended Claim 30. More specifically, the applied references fail to teach or suggest a field effect transistor comprising a substrate 12 of a single crystal semiconducting material, two spaced apart metal semiconductor compound regions 16 forming a source and drain and defining a channel there between, a first dielectric

layer 18 on said source and drain adjacent said channel, a gate dielectric layer 50 of locally reacted metal of said metal used in said metal-semiconductor compound regions on said channel, and a conductive layer on said gate dielectric layer 50 to form a gate. "To establish a prima facie case of obviousness of a claimed invention all the claimed limitations must be taught or suggested by the prior art". *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 44, 496 (CCPA 1970).

The primary reference, Kudoh, spurring the instant §103 rejection fails to teach or suggest *a gate dielectric layer of locally reacted metal of said metal used in said metal-semiconductor compound regions on said channel*, as recited in amended Claim 30. Kudoh discloses a number of embodiments of thin film transistors each of which failing to disclose *a gate dielectric layer of local reacted metal of said metal used in said metal-semiconductor compound regions on said channel*, where the portions of the metal-semiconductor compound adjacent the channel provide source/drain regions, as recited in amended Claim 30.

Kudoh discloses a number of embodiments of thin film transistors in each of which the gate dielectric is a separate and distinct material from the source/drain regions and is formed in a separate and distinct layer. Specifically, referring to Column 3, lines 2-18, Kudoh discloses where the gate dielectric 13, 92, 105, is a gate silicon dioxide film, therefore having a different composition than the titanium silicide source/drain regions 15, 16, 95. Additionally, FIG. 9 clearly depicts where the titanium silicide source/drain regions 15, 16, 95 and the gate dielectric 13, 92 are formed in different layers of the multilayer structure. Therefore, since Kudoh discloses that the gate dielectric layer and the source/drain regions are different materials positioned in separate and different layers, Kudoh fails to teach or suggest a field effect transistor

comprising a gate dielectric layer of locally reacted metal of said metal used in said metal-semiconductor compound regions on said channel, as recited in amended Claim 30.

The applied secondary reference, i.e., Coleman, et al., does not alleviate the above mentioned defects in Kudoh, since Coleman, et al. also do not teach or suggest applicants' claimed field effect transistor. Coleman, et al. disclose a method for depositing polysilicon atop TiO<sub>2</sub>, which includes anneal processing steps. Coleman, et al. do not disclose field effect transistors or forming field effect transistors comprising a gate dielectric layer of locally reacted metal of said metal used in said metal-semiconductor compound regions on said channel. Therefore, Coleman, et al. fail to teach or suggest applicants' claimed structure, as recited in Claim 30.

The §103 rejection also fails because there is no motivation in the applied references which suggests modifying the prior art structures to produce applicants' claimed field effect transistor comprising a gate dielectric layer of locally reacted metal of said metal used in said metal-semiconductor compound regions on said channel, as recited in amended Claim 30. This rejection is thus improper since the prior art does not suggest this drastic modification. The law requires that a prior art reference provide some teaching, suggestion, or motivation to make the modification obvious.

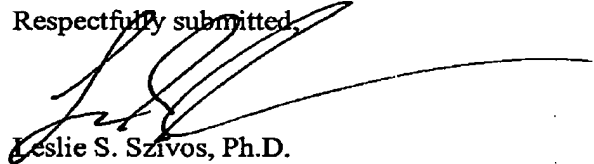
Here, there is no motivation provided in the disclosures of the applied prior art references, or otherwise of record, which would lead one skilled in the art to make the modification mentioned hereinabove. "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." In re Fritch, 972 F.2d, 1260,1266, 23 USPQ 1780,1783-84 (Fed. Cir. 1992).

There is no suggestion in the prior art of applicants' claimed field effect transistor comprising a substrate 12 of a single crystal semiconducting material, two spaced apart metal semiconductor compound regions 16, 78 forming a source and drain and defining a channel there between, a first dielectric layer 18 on said source and drain adjacent said channel, a gate dielectric layer 50 of locally reacted metal of said metal used in said metal-semiconductor compound regions on said channel, and a conductive layer on said gate dielectric layer 50 to form a gate. Therefore, all the claims of the present application are not obvious from the prior art applied in the final Office Action.

Based on the above amendments and remarks, the §103 rejection has been obviated; therefore reconsideration and withdrawal of the instant §103 rejection is respectfully requested.

Wherefore reconsideration and allowance of the claims of the present application are respectfully requested.

Respectfully submitted,



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**REPLACEMENT  
SHEET****A SCALABLE MOD FIELD EFFECT TRANSISTOR****ABSTRACT OF THE DISCLOSURE**

A field effect transistor and method for making is described incorporating self aligned source and drain contacts with Schottky metal-to-semiconductor junction and a T-shaped gate or incorporating highly doped semiconductor material for the source and drain contacts different from the channel material to provide etch selectivity and a T-shaped gate or incorporating a metal for the source and drain contacts and the oxide of the metal for the gate dielectric which is self aligned.